

REMARKS

Claims 1-3, 5-14 and 16-38 were examined by the Office, and in the Office Action of February 26, 2009 all claims are rejected. With this response claims 1, 3, 5-7, 12, 14, 16-18, 23, 25-26, 30-32 and 37-38 are amended, claims 9-10, 13, 24, 27 and 33 are cancelled and new claims 39-40 are added. All amendments and new claims are fully supported by the specification as originally filed. Applicant respectfully requests withdrawal of the rejections in view of the following discussion.

Claim Rejections Under § 112

In section 3, on page 2 of the Office Action, claims 1, 12, 23, 30-32 and 37-38 are rejected under 35 U.S.C. § 112, first paragraph as failing to comply with the written description requirement. The Office asserts that the limitation “searching for a predication value corresponding to said pixel,” is not disclosed by the originally filed specification. Applicant respectfully submits that the rejection of the claims is moot in view of the deletion of this limitation from the claims. Accordingly, applicant respectfully requests withdrawal of the written description rejection.

In section 4, on page 3 of the Office Action, claims 1, 12, 23, 30-32 and 37-38 are rejected under 35 U.S.C. § 112, first paragraph as failing to comply with the enablement requirement. The Office asserts that the limitation “searching for a predication value corresponding to said pixel,” is not disclosed by the originally filed specification. Applicant respectfully submits that the rejection of the claims is moot in view of the deletion of this limitation from the claims. Accordingly, applicant respectfully requests withdrawal of the enablement rejection.

In section 6, on page 3 of the Office Action, claims 1, 12, 23, 30-32 and 37-38 are rejected under 35 U.S.C. § 112, second paragraph as being indefinite. The Office asserts that the limitation “searching for a predication value corresponding to said pixel,” is not disclosed by the originally filed specification. Applicant respectfully submits that the rejection of the claims is moot in view of the deletion of this limitation from the

claims. Accordingly, applicant respectfully requests withdrawal of the definitiveness rejection.

Claim Rejections Under § 101

In section 8, on page 4 of the Office Action, claims 1-3, 5-14 and 16-38 are rejected under 35 U.S.C. § 101 as being nonstatutory. Applicant respectfully submits that claim 1 is statutory, because claim 1 at least stratifies the transformation requirement of the machine or transformation test. Claim 1 recites determining a difference between a pixel value and a prediction value, and using the difference to select a method for encoding the pixel into the bit string. Furthermore, claim 1 recites encoding a code word indicating the selected method. Therefore, claim 1 satisfies the transformation requirement, because claim 1 transforms a particular article to a different state or thing by encoding the code word indicating the selected encoding method. Therefore, for at least this reason, applicant respectfully requests withdrawal of the rejection to claim 1.

Independent claim 12 is directed to an image processing system that includes a device configured to process an image. The system including the device of claim 12 is clearly a machine, and therefore claim 12 satisfies at least the machine requirement of the machine or transformation test. Independent claim 23 is directed to a device for image processing that is configured to process an image. The device of claim 23 is clearly a machine, and therefore claim 23 satisfies at least the machine requirement of the machine or transformation test. Independent claim 32 is directed to a circuit for image processing that includes an encoder and a decoder. The circuit including an encoder and a decoder of claim 32 is clearly a machine, and therefore claim 32 satisfies at least the machine requirement of the machine or transformation test. Independent claims 37 and 38 are directed to devices for image processing that are configured to process an image. The devices of claims 37 and 38 are clearly machines, and therefore claims 37 and 38 satisfy at least the machine requirement of the machine or transformation test.

Comments on Amended Claims and New Claims 39 and 40

Applicant respectfully submits that the claims as amended and new claims 39 and 40 are distinguishable from the references cited by the Office in previous Office Action for at least the following reasons.

In the present claim 1 it is mentioned that in the image processing, the number of bits is fixed in an encoded bit string of a pixel. The Office had previously referred to col. 4 l. 49—50 of Weinberg (U.S. Patent No. 5,680,129), where the minimum length of 1 of the Huffman code in Weinberg is mentioned only as a problem, which is tried to be overcome by different ways. The referred paragraph does not indicate that the code of the size of 1 bit would be used or that the minimum or maximum length of the code is 1 bit. It only describes that the Huffman code is quite inefficient if the statistics is not suitable (unlike the arithmetic code). Claim 1 of the present application also discloses that a prediction value is searched that corresponds to said pixel. The Office had previously referred to col. 4 l. 58—61 of Weinberger as disclosing that the context of a pixel is compressed to predict the value of the pixel. The context, as said on l. 55—57, is determined by the pixels in a template that includes previously encoded pixels. In the present application one pixel is used for the prediction ($X_{pred}(n) = X_{deco}(n-2)$).

In Weinberger Huffman code is used for describing which coding table and which predictor is used (that is, which predictor is selected on the basis of terms and context). In the present application there is no need for any tables, because by the present solution it is possible to define the value directly when a codec is known. In Weinberger (on col. 6 l. 20—27) it is disclosed that it is important to have less error events and contexts because a separate Huffman table needs to be designed (and sent) to each context. On col. 6 l. 14—17 of Weinberger it is disclosed that the compressor is based on a fixed context model. "Context model" means that the predictor is fixed and that a fixed coding table is used. Fixed context model does not therefore mean that the amount of cells and the lengths of the codewords were fixed (as in the present application). In the present application the fixed length means that the complete codeword for one pixel is always of fixed length (and also shorter) and it includes the selection for codec, a possible sign and the word to be coded. The word to be coded is either quantized pixel value (PCM) or quantized difference of the pixel value and the

prediction value (DPCM). The efficiency of the Weinberger method is based on the fact that the predictor and the coding table is changed on the basis of the values of the previous pixels and the statistics of the whole image, whereas in the present application the predictor and coding methods are always fixed.

Furthermore, the Office had asserted that Kato (U.S. Patent No. 5,392,037) discloses (on col. 3 l. 15—17) determining the difference between the pixel and the prediction value to select the method for encoding the bit string of said pixel, which feature is not disclosed by Weinberger. On the referred part, it is disclosed that the difference between the estimate and the input data equals to estimation error. The estimation error is classified and a category index is generated. The category corresponds to the estimation error. The input data is divided and a remainder of a result of the dividing is generated. The divisor is equal to a given value which is greater than a difference between an upper and a lower limit values defining a range of the category. The category index and the remainder are encoded into corresponding codes and the codes are output. It is appreciated that the difference is not directly encoded to the codes but via category index and together with the remainder. Table 1 of Kato also presents this feature (see also par. 7 l. 29—30).

The categories of Kato seem to represent always powers of two (e.g. 8-15, 16-31 ...). Therefore in Kato's solution the limits cannot be freely selected, and also, negative and positive categories are separated (see table 1). In the present application, the limits can be any of amount and positive and negative categories are combined. Yet in addition, in Kato's solution, the category index and the remainder are encoded as such (precisely) whereas in the present invention, the difference value or the pixel value is quantized and only the quantized value is sent. Kato in fact always sends the remainder of the input data whereas in the present solution the remainder after quantizing is rejected completely and the compression of image is made possible so that each pixel as compressed is a codeword of desired length. The main difference between the Applicant's solution and Kato's solution is that categorization of Kato is carried out by appointing a ranges to an estimation error, whereas in the present solution, there are clear limits to different codecs according to the error. Limits in the present solution will depend on how far coding is possible with the previous codec and that the final codec is

a PCM coded. Otherwise the error (quantizing) would increase too much or the length of the codeword would not fit to the selected length. Kato include notably many categories because they represent powers of 2 from the pixel value, whereas in the present invention codecs are needed much less, because they represent possible quantizers in relation to lengths of original and coded data.

Therefore, for at least the reasons discussed above, applicant respectfully submits that claim 1, as well as the other independent claims, and the claims depending there from, are not disclosed or suggested by the cited references.

Conclusion

For at least the foregoing reasons, the present application is believed to be in condition for allowance, and such action is earnestly solicited. The undersigned hereby authorizes the Commissioner to charge Deposit Account No. 23-0442 for any fee deficiency required to submit this response.

Respectfully submitted,

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